AMENDMENTS TO THE CLAIMS

Please amend Claims 1 and 38.

1. (Currently Amended) A method of forming a silicon-containing compound layer in an integrated circuit, the method comprising:

performing a plurality of deposition cycles, each cycle comprising:

depositing a silicon layer on a substrate in a process chamber by exposing the substrate to trisilane, wherein the silicon layer is;

substantially removing the trisilane from the process chamber;

forming a silicon-containing compound layer by exposing the about 3-25 Å thick silicon layer to a reactive species, wherein the silicon-containing compound layer has a thickness non-uniformity of about 10% or less; and

substantially removing the reactive species from the process chamber.

2. (Original) The method of Claim 1, wherein the reaction chamber is a single substrate laminar flow reaction chamber.

3. (Cancelled).

4. (Original) The method of Claim 1, wherein depositing a silicon layer comprises chemical vapor deposition.

5. (Original) The method of Claim 1, wherein depositing the silicon layer comprises forming more than one atomic layer of silicon.

6. (Original) The method of Claim 1, wherein the reactive species comprises a nitrogen species and the silicon-containing compound layer comprises silicon nitride.

7. (Original) The method of Claim 6, wherein the nitrogen species comprises ammonia.

8. (Original) The method of Claim 6, wherein the nitrogen species comprises nitrogen active species.

9. (Original) The method of Claim 6, wherein the silicon nitride layer is more uniform than a silicon nitride layer of substantially similar thickness deposited by chemical vapor deposition with silane.

10. (Original) The method of Claim 6, wherein the silicon nitride layer is formed over an interfacial layer.

11. (Original) The method of Claim 10, wherein the interfacial layer comprises silicon oxynitride.

12. (Original) The method of Claim 10, wherein the interfacial layer comprises silicon oxide.

13. (Canceled).

14. (Original) The method of Claim 10, wherein the interfacial layer is formed by a process comprising:

depositing a silicon layer on a substrate by exposing the substrate to trisilane; and

forming the interfacial layer by exposing the silicon layer to an oxygen species.

15. (Original) The method of Claim 14, wherein the oxygen species comprises one or more oxidants selected from the group consisting of atomic oxygen, water, ozone, oxygen, nitric oxide, and nitrous oxide.

16. (Original) The method of Claim 1, wherein the silicon-containing compound layer is formed over a hydrogen passivated substrate.

17. (Original) The method of Claim 1, wherein substantially removing the trisilane comprises a removal process chosen from the group consisting of evacuating the process chamber and purging the process chamber with inert gas.

18. (Original) The method of Claim 1, wherein substantially removing the reactive species comprises a removal process chosen from the group consisting of evacuating the reactive species and purging the process chamber with inert gas.

19. (Original) The method of Claim 1, wherein the cycles are repeated until the silicon-containing compound layer has a thickness between about 3 Å and 5000 Å.

20. (Original) The method of Claim 19, wherein the cycles are repeated until the thickness is between about 3 Å and 400 Å.

21. (Original) The method of Claim 1, wherein the silicon-containing compound layer has a thickness non-uniformity of about 5% or less.

22. (Original) The method of Claim 21, wherein the silicon-containing compound layer has a step coverage of about 80% or greater.

23- 37. (Canceled)

38. (Currently Amended) A method of forming a layer, of an insulating silicon compound, having a desired thickness for an integrated circuit, comprising:

[[by]]performing multiple chemical vapor deposition cycles in a reaction chamber, each cycle comprising:

first, depositing a silicon layer on a substrate by exposing the substrate to a silicon source, wherein the silicon layer has a silicon layer thickness between about 3 Å and 25 Å, wherein depositing the silicon layer is performed under mass transport limited deposition conditions; and

second, reacting the silicon layer to partially form the layer of an insulating silicon compound, wherein trisilane is the silicon source used to deposit a first silicon layer on the substrate in a first performance of a cycle of the plurality of cycles.

39. (Original) The method of Claim 38, wherein reacting comprises nitriding and wherein the insulating silicon compound is silicon nitride.

40. (Original) The method of Claim 39, wherein the layer of an insulating silicon compound has a stoichiometry of about 43 silicon atoms per 56 nitrogen atoms.

41. (Original) The method of Claim 38, wherein reacting comprises oxidizing and wherein the insulating silicon compound is silicon oxide.

42. (Cancelled).

43. (Original) The method of Claim 42, wherein the silicon source for depositing subsequent silicon layers after depositing the first silicon layer comprises a silicon compound selected from the group consisting of silanes having a silane chemical formula Si_nH_{2n+2}, where n = 1 to 4, and halosilanes having a halosilane chemical formula $R_{4-X}SiH_X$, where R = Cl, Br or I and X = 0 to 3.

44. (Original) The method of Claim 43, wherein all silicon layers deposited after the first silicon layer are formed with the same silicon source.

45. (Previously Presented) The method of Claim 105, wherein a first substrate temperature for depositing the first silicon layer is less than about 525°C.

46. (Original) The method of Claim 45, wherein the first substrate temperature is less than about 475°C.

47. (Original) The method of Claim 46, wherein a second substrate temperature for reacting the first silicon layer is greater than the first substrate temperature.

48. (Original) The method of Claim 47, wherein depositing and reacting are performed isothermally after reacting the first silicon layer.

49. (Original) The method of Claim 48, wherein a third substrate temperature for depositing and reacting, after reacting the first silicon layer, is between about 400°C and 650°C.

50. (Original) The method of Claim 49, wherein the third substrate temperature is greater than about 525°C.

51. (Original) The method of Claim 47, further comprising evacuating the reaction chamber for at least about 10 seconds before reacting the first silicon layer.

52. (Original) The method of Claim 47, wherein the first silicon layer has a first silicon layer thickness of about 8-12 Å.

53. (Original) The method of Claim 52, wherein a temperature and a duration for reacting are chosen to prevent reacting the substrate under the silicon layer.

54. (Original) The method of Claim 52, wherein reacting the silicon layer comprises exposing the silicon layer to an atomic species.

55. (Original) The method of Claim 54, wherein the atomic species is atomic nitrogen.

56. (Original) The method of Claim 38, wherein the reaction chamber is a single substrate laminar flow reaction chamber.

57-104. (Cancelled).

105. (Previously Presented) The method of Claim 38, wherein a temperature for reacting is less than about 650°C.

106. (Previously Presented) The method of Claim 38, wherein a thickness of the first silicon layer on the substrate is about greater than or equal to a nitridation saturation depth.